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patterns. These dual occurrences encouraged rapid settlement of the islands south of Charleston, and created labor demands that brought a resurgence of African importations, ushering in the second phase of the Carolina trade.

First was the geographical change of rice-producing areas. In the 1750s inland swamps, which since the 1720s had been utilized for rice cultivation, were gradually deserted in favor of tidal and river swamps. These were better suited for growing rice because soil was more fertile and irrigation was more easily conducted. This discovery opened the remaining coastal frontier to settlement. Workers were not only needed for rice cultivation but also to clear away dense woods and growth prior to planting. Memory of the Stono Rebellion notwithstanding, large-scale use of white labor was never seriously considered. Not only was such labor scarce and expensive, but tidal swamps were infested with malaria-carrying mosquitos, and the summers there were so hot and unhealthy that whites convinced themselves they could not endure such conditions.[12] Rather than relinquish dependency on African workers, South Carolinians altered their ethnic preferences.

The second factor responsible for renewed interest in forced black labor was the cultivation of indigo in the Sea Islands. Great Britain needed large quantities of indigo for its textile industry and encouraged indigo production in the colony. But despite the prospect of a guaranteed market, and even though indigo was found growing in a wild state in Carolina, no commercial possibilities were realized until 1748. The change was precipitated by a young Sea Island woman, Eliza Lucas (later Eliza Lucas Pinckney), who from 1742 to 1744 engaged in a series of experiments. She crossbred and developed the plant through seed selection and from a West Indian indigo maker learned the difficult process of properly extracting dye from the plant. Indigo grew well in the Sea Islands and soon became the most favored commodity with the British government. Next to rice, indigo was also the most bountiful source of wealth in the province, laying the foundation for many Sea Island fortunes while further enriching British textile capitalists. Commodity output of rice and indigo during this period of economic advancement was matched by heavy African importation. From 1740 to the eve of the War for Independence, South Carolina imported over 50,000 Africans into the colony.[13] This middle period of the slave trade provided the Sea Island region with numerically dominant African ethnic groups who strongly impacted Gullah religious culture and communal organization.

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ROTATION OF CROPS

242 Planters came much later to realize the importance of soil analysis as a means of determining what fertilizers were necessary to make their fields yield the maximum quantity of cotton. The first public organization to stress the importance of soil analysis was the Agricultural Society of St. John's, Colleton. In 1840 the Society asked Professor Shepard to analyze ten specimens of the soils of Edisto Island.[29] His report received considerable attention and helped to stimulate interest in improved methods of agriculture. Edmund Ruffin's geological survey and analysis of the mineral deposits of the state and Professor Tuomey's geological survey further contributed to the planters' increasing desire to know the exact nature of their soil so that they might succeed better in cultivating their plantations.

A few enterprising planters learned at an early date that a rotation of crops improved the quality of the land. For instance, John Couper, of Cannon's Point plantation, St. Simon's Island, a native of Scotland, practised rotation of crops before 1800, and his son, James Hamilton Couper, of Hopeton plantation, carried his father's work still further.

James Hamilton Couper, an honor graduate of Yale, later visited his uncle in Glasgow and from there went to

[29] Tuomey, *Geology of South Carolina*, pp. xxxviii-xliii. The soils analyzed were as follows: (1) virgin wet mud, (2) deposit wet mud, (3) close sandy soil from high land, (4) dark gray soil from land rather flat for cotton, (5) very light sandy soil (very high land), (6) dark gray soil from land rather low, (7) close yellow sandy soil (high land), (8) close yellow soil from the most productive part of Professor Shepard's tract, (9) mud that had been exposed to the sun for nearly two months, (10) mud taken from the cotton field in which it was buried the previous year.

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Holland to study reclamation so that he might drain the fertile swamps and deltas of the Georgia coast. With slave labor he cleared the cypress brakes of the Altamaha delta, grubbing, diking, and ditching the land, sometimes at a cost of a thousand dollars an acre, until in 1826, when he bought a half interest in Hopeton plantation, he was cultivating at a profit 641 acres of improved swamp land. In 1832 J. D. Legare, editor of the *Southern Agriculturist*, of Charleston, said of Hopeton plantation:

> We hesitate not to say Hopeton is decidedly the best plantation we have ever visited, and we doubt whether it can be equalled in the Southern states. And when we consider the extent of the crops, the variety of the same, and the number of operatives who have to be directed and managed, it will not be presumptive to say that it may fairly challenge comparison with any establishment of the United States, for the systematic arrangement of the whole, the regularity and precision with which each and all of the operations are carried out, and the perfect and daily accountability established in every department.
>
> The proportions of the crop, at the time of my visit, were 500 acres in rice, 170 in cotton, and 333 in cane.[30]

Mr. Couper attracted attention as a scientific planter not only on the seaboard of Georgia and South Carolina, but in Europe as well. Sir Charles Lyell, Miss Frederika Bremer, and the Honorable Amelia M. Murray, distinguished European visitors who spent several days at Hopeton at different times during the late plantation regime,[31] also praised his plantation management and experimentation with crops.

[30] MS in Couper-Wylly Papers.

[31] Lyell, *Second Visit to the United States*, I, 261-273; Hon. Amelia M. Murray, *Letters from the United States, Cuba and Canada*, pp. 220-225; Frederika Bremer, *Homes of the New World*, pp. 485-491.

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Mr. Couper seldom allowed any of his fields to rest, a method of improving the fertility of the land followed by most sea-island planters. Instead, he fertilized the land and rotated the crops in order to replace the minerals extracted by growing plants. The following table, made from Couper's Hopeton Plantation Book, indicates for ten years the crops planted on West Old Field of eighty-five and a half acres, one of the most fertile of the seventeen fields which he annually cultivated, and at the same time illustrates his experimentation with crops:

ROTATION OF CROPS ON HOPETON PLANTATION, 1820-1829[31]

	Crops In Acres					
Year	Cotton	Corn	Cotton and corn mixed	Potatoes	Sugar cane	Pumpkins
1820	79½	0	0	6	0	0
1821	55	23¼	0	7¼	0	0
1822	78½	7	0	0	0	0
1823	78½	5	0	2	0	0
1824	36¾	4	33	4¾	0	0
1825	81	0	0	3½	1	0
1826	66	16	0	0	3½	0
1827	26¼	33	14½	8½	0	1¾
1828	75¾	0	0	8½	0	1¾
1829	36¾	0	0	0	49	0

On other fields Couper rotated peas, cotton, corn, cotton and corn mixed, potatoes, and occasionally pumpkins.

Although Couper had mixed cotton with corn as early as 1824, in 1844 Seabrook spoke of this method of rotation as having been lately adopted by a few planters in Georgia.[32] They planted cotton on alternate ridges with corn, and the next year substituted the cotton rows for the corn.

[31] MS, Hopeton Plantation Book, 1818-1831. In possession of Mrs. W. S. Lovell, Birmingham, Ala. Hopeton Plantation, on the Altamaha River, in Glynn County, Ga., contained about eleven thousand acres and in 1826 was valued at $80,412. The map on page 63 was reproduced from a map in colors in Hopeton Plantation Book.

[32] Seabrook, *Memoir on Cotton*, p. 28.

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242 Seabrook, however, thought this rotation unfitted for the South Carolina Sea Islands "where the high lands, which are limited in quantity, and unfit for corn, are alone considered safe for cotton." Instead, he recommended as a good rotation to be followed " in a small way," potatoes, or spring peas, rest, and cotton.[84]

"Rest" was the common practice of "rotation" on the Sea Islands. When the land had become exhausted by repeated cropping, its fertility was restored not only by the application of manures, but by resting the field for a certain length of time. The time necessary for restoration was dependent, of course, upon the nature of the subsoil. Enterprising planters hastened the process by thoroughly breaking up the soil, thereby exposing fresh surfaces to the atmosphere and turning the grass and weeds under to enrich the soil.

THE AGRICULTURAL LOTTERY

248 Despite these efforts at scientific farming, which resulted in methods that are generally considered as belonging to present day agricultural development, sea-island cotton was an uncertain crop. In 1808 David Ramsay, writing the history of South Carolina, spoke of planting as an annual lottery, in which on an average of several years there were many blanks and many prizes. "A few of the latter," he wrote, "are very large, but the greatest number do not much exceed the price of the ticket."[85] In successful seasons, profits were large. One crop might purchase the land which raised it; two or three more, the Negroes who cultivated it. But in unsuccessful years,

[84] *Ibid.*, p. 29.
[85] David Ramsay, *The History of South-Carolina*, II, 396.

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The leaf worm, although nearly always present, became destructive only when the conditions for its development were favorable, such as, a warm winter followed by a wet spring. Planters constantly attempted to fight the insect by seeking to raise a plant which would mature its pods sufficiently early to produce a paying crop before the worm reached its most destructive stage. Once the caterpillars appeared in great numbers, however, the average planter of the ante-bellum period knew little to do but curse the fate which sent them. By turning large flocks of turkeys into the fields, they could save many acres of cotton, but no plantation kept a drove large enough to protect all the fields in a bad year, for, when the caterpillars reached the final stage of development, they usually destroyed a crop within forty-eight hours. In 1846-1847, caterpillars reduced the estimated crop of the South from 2,400,000 bales to 1,779,000.[38] J. Swinton Whaley, of Little Edisto Island, recalls that caterpillars so greatly damaged three hundred acres of his father's cotton in 1867 that he saved only seven bags of cotton.[39] On this occasion, while driving along the main road to his summer home on the opposite side of the island, a distance of twelve miles, his father crushed caterpillars under his wheels the entire way. Having finished the fields, they were then in possession of the road. Doubtless some planters learned before 1860 that they could successfully combat the leaf worm by dusting their plants with Paris Green,[40] but this method was not common knowledge until much later.

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[38] *DeBow's Review*, VI, 126.

[39] Whaley, "History of Sea-Island Cotton." Unpublished MS.

[40] Allston, in his *Essay on Sea Coast Crops*, p. 15, advises, "Destroy the enemy

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The weather not only abetted the insects in their destruction of the cotton crops, but sometimes itself brought ruin. In 1819 James Hamilton Couper was found recording in his plantation book, "In the Spring, the Cotton was very generally destroyed by Frost," and "On the night of the 14th Oct^r. a sharp white frost destroyed about 70 acres of cotton at Hopeton."[41] In 1823 he wrote:

> The crop was set in good time; and was unusually promising until the excessive rains which commenced about the middle of July. These rains continued nearly two months, and occasioned the cotton to drop nearly the whole of the middle & under crop. The upper crop in quantity and maturity promised well, but from the diseased habit which the plant had acquired never opened.[42]

In 1826 he wrote, "This is the only cotton crop since 1818 which has not been cut off by spring freshes, early fall frosts, or gales of wind," and the following year he again recorded, "A very high fresh which occurred about the end of May nearly destroyed the Cotton in Carr's Is." There were heavy rains again in 1828 and 1829, and in 1830 "a very severe Hail Storm was so destructive to the cotton crop, that the failure . . . was nearly entire." With this year, Couper left off recording his observations on crops, but in a letter to his son in 1855 he wrote, "We have had a glut of rain during the week; and as was to be expected the cotton is shedding freely. Three fourths of the Cotton crops are destroyed by the August rains."[43]

in embryo, as the energetic planter . . . has already done." He doubtless refers to dusting the plants with a mixture of Paris Green, rosin, and damaged wheat flour.

[41] Hopeton Plantation Book. [42] *Ibid.*

[43] Couper-Wylly Letters, August 23, 1855, James Hamilton Couper to Hamilton Couper.